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Cont'd*

- (c) passing the extracted gas through a first a desiccant medium arranged in manner only to reduce water vapor content thereof;
- (d) following step (c), passing the extracted gas through a second medium selected to reduce the organic vapor content thereof;
- (e) following step (d) passing the extracted gas through a filter to reduce the particulate matter content thereof; and
- (f) following step (iv), returning the extracted gas to the enclosure.

REMARKS

Applicants' invention is directed to solving a problem of protecting optical components of a laser from contamination by particulate matter, water vapor, or organic vapors. The particulate matter may be present in the laser intrinsically or may be generated during operation of the laser by reaction between water or organic vapor with radiation produced by the laser. This problem is described in detail in the Background section of Applicants' specification.

Applicants address the problem by placing the components to be protected within a sealed enclosure including a gaseous atmosphere and recycling the atmosphere through a gas conditioning apparatus. The gas conditioning apparatus includes a desiccant medium, a medium for trapping organic vapors, and a filter for trapping particulate matter. A pump is arranged to extract gas from the enclosure via a first conduit and deliver the extracted gas to the gas-conditioning arrangement via said second conduit. The gas conditioning arrangement is configured such that the extracted gas delivered thereto by the pump passes, in sequence, through the desiccant medium, the organic vapor trapping medium, and the filter, and is then returned to the enclosure via a third conduit. As noted in the specification, the enclosure is sealed in order to minimize the ingress of particulate contaminants as well as water and organic vapors. Further, the desiccant portion of the gas conditioning apparatus is operated only in a manner to reduce water vapor, never to add water vapor to the system.

In the Office Action, the Examiner rejected claim 2, 6 and 12 under 35 USC 112. Claim 2 has been amended and claim 12 has been cancelled. Claim 6 has been amended to correct the references to "said extracted air" in lines 14 to 15 and "gas conditioning arrangement" in line 8. It is believed, however, the use of the term "gas" in line 11 is proper as it necessarily follows from recitation of the "gaseous atmosphere" of line 3. In view of the

above, it is submitted that the remaining claims are in proper form and the rejection under 35 USC 112 can now be withdrawn.

In the Office Action, the Examiner rejected claim 1-3, 12 –14 and 17 as being anticipated by Shah (6,428,608). The remainder of the claims were rejected based on Shah and McMahan (4,229,709).

Applicants have cancelled claim 1 and replaced it with new claim 18. Claim 6 has been amended to more clearly distinguish over the art.

All the remaining claims are now focused directly on a laser system. The components of the system are mounted in a sealed housing. A purging system is provided for recirculating the gas and for extracting vapors and contaminants in a three-stage process. The removal of the vapors and contaminants allows the laser to maintain optimal performance.

In the Office Action, the Examiner cited the patent to McMahon for the teaching of a purging system in a laser. As recognized by the Examiner, while McMahon relates to a laser, it does not teach many of the features claimed herein. In fact, McMahon merely teaches connecting a filter to a chamber mounted near the end of a discharge tube. McMahon relies on differential pressure to drive contaminants into the filter. McMahon does not teach a three-stage filter as disclosed herein.

The Examiner relies on the patent to Shah for its teaching of a three stage filter in an air circulation system. The patent to Shah, however, is related to a circulation system for a commercial office building, not a laser. It is difficult to imagine how or why one skilled in the art of laser design would ever consider the teachings set forth in a patent related to controlling air quality in a commercial building, much less to combine those teachings with the teachings of McMahan. Given the dramatic differences in the art, this suggested combination is simply unreasonable.

*interpolated as
not laser
art but
gas separator
art for filter
inc*

However, even if such a combination were reasonable, there are fundamental differences between the Shah concepts and the invention set forth in independent claims 6 and 18. For example, while Shah is interested in removing particles, he is also interested in maintaining a comfort level of water vapor, i.e., 40 to 60% relative humidity. (See Shah, column 1 line 50). For this reason, the Shah system is set up to both remove and add water vapor. In contrast, in Applicants' laser system, the intent is always to remove water vapor. Claim 6 has been amended to make this distinction more clear. In addition, considering that people work in the commercial

space, Shah provides for introducing fresh air into the space. Such an approach is exactly opposite to Applicants' system which specifies a "sealed" enclosure. If Applicants' system were to introduce fresh air into the enclosure, the performance of the laser would rapidly drop off.

Accordingly, it is respectfully submitted that Shah, which relates to dramatically different subject matter and, in addition, teaches that it is desirable to add water vapor and introduce fresh air into the building, is significantly different from Applicants' claimed invention and cannot overcome the deficiencies of the McMahon reference in rendering obvious Applicants' invention as recited by claims 6 and 18. In view of the above, it is respectfully submitted the claims 6 and 18 define patentable subject matter and allowance thereof is respectfully requested.

Respectfully submitted,

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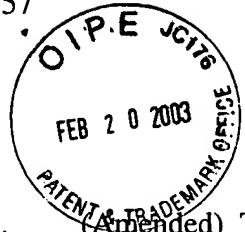


EXHIBIT A

2. (Amended) The method of claim [1] 18, wherein said first [media] medium is silica gel.

3. (Amended) The method of claim [1] 18, wherein said second medium is activated carbon.

4. (Amended) The method of claim [1] 18, wherein said second medium is a molecular sieve.

5. (Amended) The method of claim [1] 18 wherein said filter is a HEPA filter.

6. (Amended) A laser, comprising:
a[n] sealed enclosure;
a plurality of optical components located in a gaseous atmosphere within said enclosure;
a gas conditioning arrangement including a desiccant medium, a medium for trapping organic vapors, and a filter for trapping particulate matter;
a pump, said pump in fluid communication with said enclosure via a first conduit and in fluid communication with said gas conditioning arrangement via a second conduit and said gas conditioning arrangement being in fluid communication with said enclosure via a third conduit;
said pump being arranged to extract gas from said enclosure via said first conduit and deliver said extracted gas to said gas-conditioning arrangement via said second conduit; and
said gas conditioning arrangement being configured such that said extracted [air] gas delivered thereto by said pump passes, in sequence, through said desiccant medium, said organic vapor trapping medium, and said filter and is then returned to said enclosure via said third conduit and operated only in a manner intended to reduce water vapor, organic vapor and particulate matter from the gas.